

# Physical findings and tests useful for differentiating lymphedema

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A 72-year-old woman presented with swelling of the right lower limb which had progressed in 1 month. She had a past medical history of cardiac sarcoidosis and was taking prednisolone 5 mg/day. Physical examination revealed nonpitting edema with skin sclerosis throughout the right lower limb and a black/red ulcer 28 mm × 17 mm in size with unclear boundaries on the front of the right lower limb (Figure 1). Stemmer's sign was positive (Figure 2 and Video S1). Cervical to pelvic computed tomography (CT) showed right groin, upper thigh, obturator foramen, and paraaortic lymphadenopathy. Venous thrombosis was not observed on lower limb CT. Indocyanine green lymphography showed remarkable lymphedema of the right lower limb. Biopsies of the right inguinal lymph node and the skin lesion of the right lower leg showed histological features consistent with squamous cell carcinoma, and a diagnosis of lymphedema due to lymph node metastasis of the right lower squamous cell carcinoma was made. Lymphatic vein anastomosis, skin malignant tumor resection, and full-thickness skin grafting were performed, and edema of the right lower limb improved. Although chemotherapy was indicated, the patient and her family members did not accept to have it, and Best Supportive Care was chosen. Thereafter, due to the relapse of the present disease, she died 3 months later.

Lymphedema is often unilateral, and in the acute stage, it presents with pitting edema. However, as the disease progresses, the edema becomes nonpitting.<sup>1</sup> Stemmer's sign is useful in diagnosing lymphedema as it is present in 92% of the cases.<sup>2</sup> When trying to pinch the dorsal skin over the proximal phalanx of the second or third toe, Stemmer's sign is positive if the skin cannot be pinched.<sup>2,3</sup> The sign is often used on the second or third toe but can also be used on all other toes.<sup>3,4</sup> As in this case, pinching the dorsal skin immediately proximal

to the metatarsophalangeal joint can be substituted for technical simplicity.<sup>2</sup> Indocyanine green (ICG) lymphography is also useful for diagnosing lymphedema. ICG lymphography is now being used by many



**FIGURE 1** Nonpitting edema with skin sclerosis throughout the right lower limb and a black/red ulcer 28 mm × 17 mm in size with unclear boundaries on the front of the right lower limb

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**FIGURE 2** Stemmer's sign. The dorsal skin immediately proximal to the metatarsophalangeal joint cannot be pinched when pinching the skin (positive)

lymphatic surgeons because it allows them to see all the anatomy of the lymphatic vessels, leaking pumping capacity, and dermal reflux. The diagnostic ability of ICG lymphography and its evaluation capability for disease severity is similar to lymphoscintigraphy which is the gold-standard examination for extremity lymphoedema but with less invasiveness and a lower cost.<sup>5</sup> Lymphedema is classified as primary or secondary lymphedema, and the causes of secondary lymphedema are associated with complications of lymph node dissection and radiation therapy, deep vein thrombosis, arthritis, and malignant tumors.<sup>1</sup> It is necessary to differentiate malignant tumors, especially when the disease progresses in the course of months.

## CONFLICT OF INTEREST

The authors have stated explicitly that there are no conflicts of interest in connection with this article.

## AUTHOR CONTRIBUTIONS

All authors had access to the data and a role in writing the manuscript.

## INFORMED CONSENT

The patient's written consent was obtained for publication.

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